

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1. (currently amended) An information recording apparatus which irradiates a laser light on a recording medium and forms recording marks according to a recording signal, comprising:

a driving source which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a light source which emits the laser light;

a signal generating unit which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control unit which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the second magnitude is smaller than the first magnitude, the intermediate bias portion is continuous in time to the top pulse, and the last pulse is continuous in time to the intermediate portion,

wherein the signal generating unit shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

2. (original) The information recording apparatus according to claim 1, wherein a shift quantity of the top pulse is a value between $0.1T$ and $2.0T$.

3. (original) The information recording apparatus according to claim 1, wherein the signal generating unit sets the first magnitude to a value between 1.1 times and 2.0 times of the second magnitude, when the recording medium is rotationally driven at the second rotation speed.

4. (currently amended) An information recording apparatus which irradiates a laser light on a recording medium and forms recording marks according to a recording signal, comprising:

a driving source which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a light source which emits the laser light;

a signal generating unit which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control unit which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the second magnitude is smaller than the first magnitude, the intermediate bias portion is continuous in time to the top pulse, and the last pulse is continuous in time to the intermediate portion,

wherein the signal generating unit shifts a position of the last pulse behind a position of the last pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

5. (original) The information recording apparatus according to claim 4, wherein a shift quantity of the last pulse is a value between $0.1T$ and $2.0T$.

6. (original) The information recording apparatus according to claim 4, wherein the signal generating unit sets the first magnitude to a value between 1.1 times and 2.0 times of the second magnitude, when the recording medium is rotationally driven at the second rotation speed.

7. (original) An information recording apparatus which irradiates a laser light on a recording medium and forms recording marks according to a recording signal, comprising:

a driving source which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a light source which emits the laser light;

a signal generating unit which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, and a pulse train portion having one or a plurality of pulse following the top pulse, based on the recording signal; and

a control unit which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the signal generating unit shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first

rotation speed, when the recording medium is rotationally driven at the second rotation speed.

8. (original) The information recording apparatus according to claim 7, wherein a shift quantity of the top pulse is a value between $0.1T$ and $1.5T$.

9. (original) The information recording apparatus according to claim 7, wherein the signal generating unit sets a duty ratio of the pulse train portion to a value between 0.3 and 0.9, when the recording medium is rotationally driven at the second rotation speed.

10. (currently amended) An information recording method which irradiates a laser light from a light source on a recording medium and forms recording marks according to a recording signal, comprising:

a driving process which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed; a signal generating process which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control process which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the second magnitude is smaller than the first magnitude, the intermediate bias portion is continuous in time to the top pulse, and the last pulse is continuous in time to the intermediate portion,

wherein the signal generating process shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

11. (currently amended) An information recording method which irradiates a laser light from a light source on a recording medium and forms recording marks according to a recording signal, comprising:

a driving process which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a signal generating process which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude, a last pulse located at a back end portion and having the first magnitude, and an intermediate bias portion located between the top pulse and the last pulse and having a second magnitude, based on the recording signal; and

a control process which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the second magnitude is smaller than the first magnitude, the intermediate bias portion is continuous in time to the top pulse, and the last pulse is continuous in time to the intermediate portion,

wherein the signal generating process shifts a position of the last pulse behind a position of the last pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed.

12. (original) An information recording method which irradiates a laser light from a light source on a recording medium and forms recording marks according to a recording signal, comprising:

a driving process which rotationally drives the recording medium at least at a first rotation speed and a second rotation speed higher than the first rotation speed;

a signal generating process which generates a recording pulse signal including a top pulse located at a front end portion and having a first magnitude and, and a pulse train portion having one or a plurality of pulse following the top pulse, based on the recording signal; and

a control process which irradiates a laser pulse on the recording medium by controlling the light source based on the recording pulse signal,

wherein the signal generating process shifts a position of the top pulse ahead of a position of the top pulse in a case that the recording medium is rotationally driven at the first rotation speed, when the recording medium is rotationally driven at the second rotation speed..

13. (new) The information recording apparatus according to claim 1, wherein the signal generating unit increases a pulse width from a front end portion of the top pulse to a back end portion of the last pulse by shifting the position of the top pulse.

14. (new) The information recording apparatus according to claim 4, wherein the signal generating unit increases a pulse width from a front end portion of the top pulse to a back end portion of the last pulse by shifting the position of the top pulse.

15. (new) The information recording method according to claim 10, wherein the signal generating process increases a to a value between 1.1 times and 2.0 times of the second magnitude, when the recording medium is rotationally driven at the second rotation speed.

16. (new) The information recording method according to claim 11, wherein the signal generating process increases a pulse width from a front end portion of the top pulse to a back end portion of the last pulse by shifting the position of the top pulse.